

REMARKS

Claims 1-13 were pending in the application.

In the Office Action of May 21, 2003, claims 1-13 were rejected and the specification was objected to.

In response, claim 1 has been amended and the specification has been amended. Claims 8-13 also have been amended to correct typos, and not for any reason related to patentability, and without narrowing the scope thereof.

A. Objection to Specification

The title of the invention was objected to for being not descriptive. In response, Applicants have amended the title per Examiner's suggestion to "Non-aqueous Electrolyte Secondary Cell With a Lithium Metal Phosphate Cathode." Applicants respectfully submit that this objection has been overcome and that it be withdrawn.

B. §112 Rejection

Claims 1-12 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. In particular, claim 1 was rejected because the range of the variable y in the electrode is from 2.0 to 0.8.

The claims and the specification have been amended to reflect the range of the variable y in the electrode should be from 0.0 to 0.8. Applicants respectfully submit that the above-identified amendment to the claims, the 35 U.S.C. §112 rejection, has been obviated. Accordingly, Applicants respectfully request withdrawal of this rejection.

C. §103(a) Rejections

Claims 1, 3, 4, 12 and 13 were rejected under 35 U.S.C. §103(a) as being unpatentable over Goodenough et al. (U.S. Patent No. 5,910,392) in view of JP 2646657 (JP'657). Claims 2 and 5-11 were rejected under 35 U.S.C. §103(a) as being unpatentable over Goodenough et al. in view of JP '657 as applied to claim 1, and further in view of

Barket et al. (U.S. Patent No. 5,871,866). Applicants respectfully traverse these rejections.

Claim 1 now recites a non-aqueous electrolyte secondary cell comprising: a cathode employing a cathode active material containing a compound of the olivinic structure having the formula $\text{Li}_x\text{Fe}_{1-y}\text{M}_y\text{PO}_4$, where M is at least one selected from the group consisting of Mn, Cr, Co, Cu, Ni, V, Mo, Ti, Zn, Al, Ga, Mg, B and Nb, with $0.05 \leq x \leq 1.2$ and $0 \leq y \leq 0.8$; an anode; and an electrolyte solution; said cathode, anode and the electrolyte solution being housed in a container; wherein the amount of said electrolyte solution is adjusted to provide a void in said container of not less than 0.14 cc and not larger than 0.3 cc per 1Ah of the cell capacity.

None of the cited references disclose the range specified in claim 1. Goodenough discloses transition-metal materials used as electrodes in an alkali-ion secondary battery. While it discloses the use of $\text{Li}_x\text{Fe}_{1-y}\text{M}_y\text{PO}_4$ as a cathode active material, it does not disclose the amount of the electrolyte solution to provide in a void in the container of not less than 0.14 cc and not larger than 0.3 cc per 1Ah of the cell capacity. On the other hand, while JP '657 does disclose the amount of the electrolyte solution, it does not disclose the amount of the electrolyte solution to provide in a void of not less than 0.14 cc and not larger than 0.3 cc per capacity 1Ah. It discloses the amount of electrolyte to be of 0.33 cc per 1Ah or more.

When olivinic lithium phosphorous oxide is used as a cathode active material, the amount of gas generated with the reaction is small. If the void is set to 0.14 cc per 1Ah capacity, a smaller value than the cited references, the buffer function is performed efficiently. However, if the void is less than 0.14 cc, it becomes difficult to avoid leakage of the electrolyte solution. (Spec. pages 12-13.)

On the other hand, if the void exceeds 0.3 cc, the cell is more vulnerable to shock, such as vibrations. This also lowers the energy density per unit cell volume to detract the use

of the olivinic lithium phosphorus oxide as a cathode active material. (Spec. pages 12-13.)
None of the cited references disclose or even suggest that the amount of electrolyte solution is adjusted to provide a void in said container of not less than 0.14 cc and not larger than 0.3 cc per 1Ah of the cell capacity.

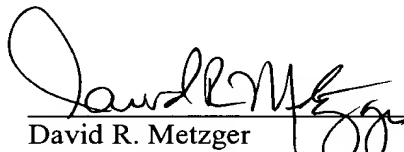
Accordingly, Applicants submit that the claimed invention does not render obvious over the applied references alone or in combination as suggested by the Examiner.

Claims 2-12 all depend directly from claim 1 and are therefore allowable for at least the same reason that claim 1 is allowable.

In view of the foregoing, it is submitted that the pending claims 1-13 are patentable over the references cited by the Examiner. Further, all of the Examiner's objections and rejections have been addressed herein. It is, therefore, submitted that the application is in condition for allowance. Notice to that effect is respectfully requested.

Respectfully submitted,

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